

Application No. 09/707,624

REMARKS

Claims 1, 12 and 14 have been amended to state that a target area that is modeled using a three dimensional model includes a virtual surface. A virtual surface is one that does not actually exist within the real-world site within which the target area is modeled. This limitation is not found in DiCicco et al. (hereafter "*DiCicco*") or the other art of record.

Claims 17- 29 are new. They are limited to methods and apparatus that make use of a three-dimensional model of a site that is being videographed, which model does not include every detail or surface of the site. For example, *Beattie* requires that a three-dimensional model of the entire venue be created for use in its matching process (module 24 in Fig. 1.) The significance of modeling less than the entire site as set forth in independent claims 17 and 28 is that it requires substantially less processing power than rendering a synthetic scene of the entire site.

As remarked in prior responses, *DiCicco* discloses a fundamentally different approach to that of the present invention and the invention described, for example, in *Beattie*. The prior rejection of claims 1-17 based on *DiCicco* is traversed. *DiCicco* landmark mapping scheme where prominent features of a scene are used as landmarks for locating insertion regions within an image. (*DiCicco*, col. 6, lines 43-52). Landmarks comprise horizontal, vertical, diagonal, and corner features of a scene. (*DiCicco*, col. 6, lines 54-56). Each landmark is assigned an X,Y coordinate location as the reference location of the insertion region such that an insertion region may be selected by an operator by selecting a single X,Y coordinate location. (*DiCicco*, col. 7, lines 38-40, 45-50)(emphasis added). Thus, *DiCicco* discloses use of only a two-dimensional reference array for determining insertion regions within a scene.

The examiner asserts that *DiCicco*,

... is also suggested [sic] a three-dimensional reference model as claimed, because the camera 12 is pointing in relation to a known predefined three-dimensional scene of a site, See Fig. 1 where the camera is pointing to a three-dimensional scene (baseball game), and see also col. 16, lines 18, 23, col 17, line 8.

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The examiner cites simply a picture of a baseball game and a set of dependent claims that reference a "three dimensional landmark model." However, the only places in the entire specification that reference a three-dimensional model are in these dependent claims. The only landmark models that are described in the specification by *DiCicco* utilize an X,Y coordinate scheme to describe the geometric relationships between landmarks. These landmark models are defined using a two-dimensional "array" superimposed on an image of the scene taken with the camera. See generally the section entitled "Creating a Reference Image", starting at col. 6, line 64, and continuing to col. 7, line 59. The landmark models are illustrated in Fig. 7A and 7B. These are clearly two-dimensional models. Search functions are used to locate the same landmarks in subsequent images from the camera, allowing calculation or adjustment for translation and zoom of the coordinate array due to motion or zoom of the camera. See col. 10, line 18 to col. 11, line 33. A "three dimensional" model of a target area within a real three-dimensional site is simply not disclosed or enabled.


One advantage of using a true three dimensional model is that, as set forth in claim 1 of the present invention, the target image is more accurately rendered. The shape of the image, for example, changes based on perspective and location of the target surface. The claimed invention determines how the target image should appear in real time, based on the actual position and orientation of the target area within the model from the perspective of the camera. In *DiCicco*, on the other hand, a logo is "prepared" in advance rather than rendered in real time with the shape of the logo remaining fixed. Zoom warping may be applied to the logo based on the zoom of the camera during insertion, but no real time changes are otherwise contemplated. "This zoom warping occurs during the broadcast just prior to insertion as opposed to shape warping which occurs prior to the broadcast." Col. 8, line 24-26. Thus, *DiCicco et al.* does not render a target image based on a three-dimensional model and the pointing direction of the camera, as required by independent claims 1, 12 and 14.

For at least the foregoing reasons, Applicant respectfully submits that all pending claims are allowable.

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No fee is believed due with this Response. However, the Commissioner is hereby authorized to charge any fees that may otherwise be due with this Response to Deposit Account No. 13-4900 of Munsch Hardt Kopf & Harr, P.C.

Respectfully submitted,


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I hereby certify that this correspondence is being transmitted by facsimile to the U.S. Patent and Trademark Office at 703-872-9306 on October 4, 2004.


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